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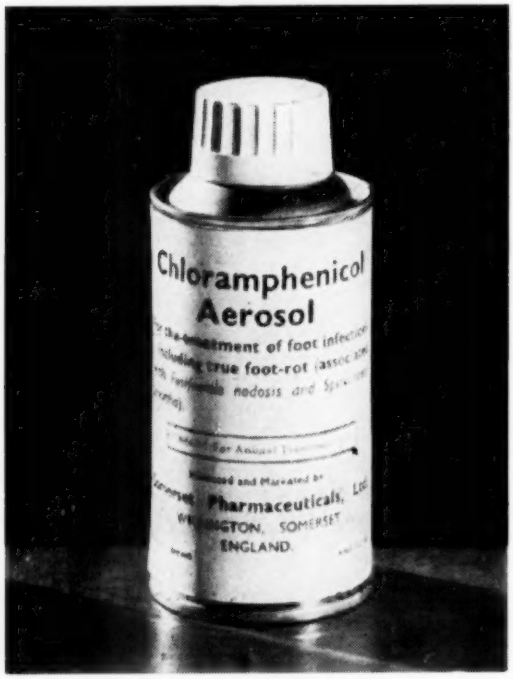

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Dilatation and Torsion of the Bovine Abomasum

BY

P. A. NEAL and P. J. N. PINSENT

School of Veterinary Science, University of Liverpool

SUMMARY.—A description is given of the clinical features of dilatation and torsion of the abomasum in cattle. The nature of the torsion is described and discussed.

Introduction

SURGICAL disease of the bovine digestive tract presents an intriguing and often frustrating problem in general farm practice. Clinicians have long been aware of the surgical conditions affecting the fore-stomachs and intestine of the cow. Traumatic reticulitis, in particular, has occurred so frequently in post-war years that in the diagnosis of abdominal conditions this disease is usually uppermost in the clinician's mind.

It is only of recent years that the significance of the bovine abomasum as a focus of surgical disease has been generally appreciated. Displacement of the abomasum is now widely recognised as a clinical entity and has been the subject of a number of papers, but dilatation and torsion of the abomasum have received but scant attention in the English literature. Individual cases of dilatation with torsion have been described in America by Fincher (1927), Danks (1937), and Fox and Fincher (1956). These cases all proved fatal, and at *post-mortem* examination torsion and dilatation of the abomasum, together with a lesser degree of torsion of the omasum and reticulum, were noted. In Danks's case the torsion of the abomasum was " . . . in a clockwise direction looked at from behind," whilst in those of Fox and Fincher it was " . . . in a counter-clockwise direction when viewed from a dorsal or posterior position." More recently, Julian, Ditchfield, and Coleman (1959) described the *post-mortem* examination of a cow in which they found torsion and dilatation of the abomasum, which had moved upwards and backwards and was half rotated in a counter-clockwise direction. Steere (1959) gave a general description of the clinical features of dilatation and torsion of the abomasum, but made no reference to the direction or degree of the torsion. In England, Richardson (1956) described a case in a 3-year-old Friesian heifer in which he corrected the torsion by surgical intervention, but whilst he noted that the abomasum had rotated through 180°, he did not state the exact nature of the torsion.

In view of the apparent rarity of the disease in England and America, it is somewhat surprising to find that simple dilatation and dilatation with torsion of the abomasum are well recognised clinical conditions in Denmark. Emsbo (1943) reviewed 52 cases of torsion giving details of the clinical picture and *post-mortem* findings. In 33 cases there was a 180° torsion to the left, in 4 a 360° torsion to the left, and in 1 a 180° torsion to the right. In the remaining 14 cases rupture of the abomasum had occurred. Emsbo considered prognosis in cases of this condition to be grave, and doubted the feasibility of successful treatment. However, in 1945 Loje described the successful treatment of 2 cases, and in a later publication (Loje, 1948) gave details of 22 cases, 16 of which were successfully treated. Bischoff (1953) reviewed the literature on the subject and described his personal experiences of some 25 to 30 cases. The clinical features described by him agree closely with those reported by the previously cited authors, but in regard to the actual nature of the torsion there appears to be some discrepancy between the text, in which Bischoff describes it as a " transverse axis torsion " and his illustrative diagrams which clearly depict torsion about a vertical axis. Bischoff recognises 2 distinct but closely related conditions: (1) dilatation, and (2) dilatation with torsion. He considers that dilatation of the abomasum is the primary condition which, when it has reached a certain degree, precipitates torsion. This suggestion now appears to be generally accepted in Denmark (Steere). Earlier workers, however, were of the opinion that dilatation is the sequel to torsion (Emsbo, Loje).

It appears from the reports quoted above that where torsion has occurred the abomasum is not confined to one axis of rotation. However, it is possible that this multiplicity of axes is, in fact, more apparent than real, as the description of the

rotation in several instances is ambiguous to say the least. In the present writers' series of cases, rotation has constantly been about the same axis and in the same plane, although the direction of rotation (*i.e.* clockwise or anticlockwise) has varied. In the last 3 years, 4 cases of dilatation and 5 cases of torsion of the abomasum have been attended at this Field Station. Of the cases of simple dilatation, 2 recovered spontaneously, and in 2 the abomasum was drained surgically. All the cases of torsion were critically ill on admission; 2 were operated upon but subsequently died; 2 were destroyed *in extremis*; and 1 died before operation could be performed. This report comprises an account of the clinical features of these cases and a description of the *post-mortem* findings in the torsion cases with particular reference to the nature of the torsion.

Clinical Features

It appears from the reports of the Danish workers, and from the experience of the present writers, that cases of torsion are invariably preceded by a phase of dilatation, though all cases of dilatation do not necessarily proceed to torsion but may spontaneously recover (Begg, 1950; Bischoff, Steere). It is, therefore, convenient to describe in the first place the clinical picture presented in cases of simple dilatation, followed by an account of the symptoms exhibited when torsion supervenes. In order to avoid a tedious account of each of the cases under review, it is proposed to give a general description of the clinical aspects of the conditions as seen in these cases, incorporating where considered relevant the observations of other workers. Brief case protocols are presented below.

TABLE I
BRIEF DETAILS OF 4 CASES OF SIMPLE DILATATION OF THE ABOMASUM

Case	Breed	Age	Sex	Onset of symptoms, time after parturition	Severity	Operation performed	Observations
A	Friesian	3 y.o.	F.	1 week	Mild	+	Abomasum contained impacted sand—manually evacuated. Operation successful
B	Jersey	Aged	F.	1 ,,	,,	—	Distended abomasum demonstrated on auscultation and rectal examination. Spontaneous recovery
C	Ayrshire	4 y.o.	F.	2 weeks	,,	+	Abomasum contained impacted sand and food material. Operation successful
D	,,	6 y.o.	F.	5 ,,	,,	—	Distended abomasum demonstrated on auscultation and rectal examination. Spontaneous recovery

(a) *Dilatation phase*. The condition is usually seen in adult cows within a few weeks of calving, although cases have been recorded in calves, heifers, and bulls (Bischoff). The onset is insidious, being marked by vague digestive disturbances, inappetence, reduced milk yield, and a variable degree of ketosis. The temperature is normal but the pulse rate is accelerated to about 90 to 100 per minute. Abdominal pain may be manifested by the cow occasionally kicking at her belly, and turning her head towards the right flank. Ruminal movements are weak and infrequent and rumination is in abeyance. The faeces are reduced in amount, are frequently diarrhoeic and foul smelling and may contain changed blood. However, they may be normal in consistency (Bischoff).

In spite of the rather non-specific nature of these symptoms, the dilatation of the abomasum can readily be detected by examination of the right flank. Visual examination will in many cases reveal distension of this area by the distended abomasum, and auscultation of this area reveals typical high-pitched fluid sounds. Vigorous ballottement of the right ventral abdominal wall gives rise to loud splashing sounds, and if while auscultating the flank the last rib is percussed a markedly resonant sound results. The sounds are virtually identical in nature to, though somewhat louder than, those heard on auscultation of the left abdominal wall in cases of displaced abomasum. In many cases, rectal examination reveals the distended abomasum far forward in the right side of the abdominal cavity.

As stated previously spontaneous recovery may occur, but more frequently the cow's condition progressively worsens and the dilated organ undergoes torsion.

(b) *Torsion*. Once torsion is established the condition rapidly progresses and death as a rule quickly supervenes. The subject is in a state of shock, manifested by a rapid pulse (120 to 160 per minute), subnormal temperature, cold extremities, extreme dullness, and weakness. Severe abdominal pain is evinced by grunting, groaning, grinding of the teeth, adoption of abnormal attitudes when standing or lying down and kicking at the belly. All food is refused but water may be taken readily. Distension of the right flank is obvious, and auscultation, percussion, and ballottement of the right flank reveal similar sounds to those described in the earlier stages of the condition. Defaecation is completely in abeyance, the rectum being virtually empty apart from a small quantity of tarry mucus. Through the rectal wall the grossly distended abomasum can be palpated, extending back in some cases almost to the pelvic inlet.

When this stage is reached death usually occurs within a day or so, presumably due to a combination of toxaemia and shock, although as reported by Emsbo, sudden death due to rupture of the abomasum may occur.

Treatment

Treatment of the condition is by surgical drainage of the dilated abomasum followed by manual correction of the torsion if present.

Operation is performed in the standing position under paravertebral or local infiltration anaesthesia. A vertical 6-inch incision is made through the right flank. On entering the abdominal cavity the enormously dilated abomasum can be identified immediately. The lower commissure of the abdominal wound is packed with a sterile towel to minimise subsequent contamination by abomasal contents. A purse-string suture is inserted at a convenient site in the abomasal wall enclosing a circle about $\frac{3}{4}$-inch in diameter. The suture is for the present left untied. The abomasum is punctured in the centre of the area encircled by the suture and a $\frac{1}{2}$-inch-diameter rubber tube inserted into its lumen, and the contents are siphoned off. When drainage is complete the purse-string suture is pulled tight and tied off. The closure is then oversewn with 2 or 3 Lembert sutures. The reduction in size of the abomasum now permits manual exploration of the abdomen. If no torsion is present no manipulation is necessary. If torsion has occurred, it is corrected manually after the direction of rotation has been ascertained.

In 2 cases of dilatation unaccompanied by torsion, the present writers found it necessary to open the abomasum in order to remove manually a large quantity of impacted material in the fundus of the organ. In one (Case A) approximately 20 lb. of sand were removed, and in another (Case C) about a bucket and a half of a mixture of sand and finely divided food material. Closure of the abomasal wound was by means of a continuous Connell suture, and a fold of omentum was sutured over the wound in an attempt to prevent subsequent adhesions.

Closure of the abdominal wound is performed in a routine manner.

Torsion of the Abomasum—*Post-mortem* Findings

Post-mortem examination is best carried out with the cow lying on her left side, with her right abdominal wall and last 3 ribs removed. By this means the relevant organs are adequately exposed with the minimum of displacement. The most striking finding is the gross distension of the abomasum, which may occupy almost the whole of the right side of the abdominal cavity. Careful examination reveals that the abomasum and omasum have rotated in a vertical plane about a common transverse axis passing approximately through the omaso-abomasal orifice. The rotation may be either in a clockwise or anticlockwise direction when the organs are viewed from the right side.

(1) *Clockwise Torsion.* In this type the omasum rotates downwards, becoming situated ventrally on the anterior abdominal floor. The abomasum rotates upwards through about 90°, its greater curvature thus becoming disposed vertically (see Fig. 2). This rotation causes a stenosing kink in the duodenum near its hepatic attachment and this factor probably contributes to the further distension of the abomasum. The upward displacement of the abomasum puts great tension on the greater omentum and may result in its being torn away from its attachment along the left horizontal groove of the rumen.

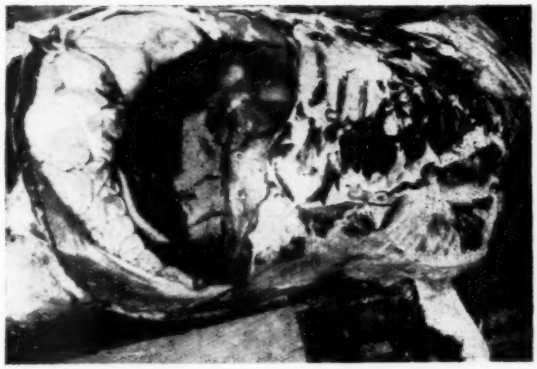

PLATE I.—Clockwise torsion of the abomasum. *Cf.* Fig. 2.

PLATE II.—Anticlockwise torsion of the abomasum. *Cf.* Fig. 3.

(2) *Anticlockwise Torsion.* In this the omasum take a more posterior position in the abdominal floor than occurs in the clockwise type. The abomasum rotating through an angle of approximately 270° again reaches a position above the omasum, this time with the greater curvature lying against the roof of the abdomen. The pyloric end of the abomasum lies antero-ventrally and the duodenum passes ventral to the abomasum before passing upwards in the greater omentum (see Fig. 3). This rotation puts great tension on the lesser omentum which may rupture at its hepatic attachment. Considerable tension is also exerted on the antero-ventral part of the greater omentum, which is stretched in a forward direction as the rotation occurs.

In both cases the liver is constantly displaced medially by the dilated abomasum which anteriorly becomes interposed between the liver medially and the diaphragm laterally. The reticulum also is involved in the torsion, becoming displaced medially. Compression of the omasal and abomasal vessels following the torsion results in severe congestion and oedema of the serous surfaces of these organs. The abomasum is distended with gas and several gallons of foul-smelling, coffee-coloured fluid. Its mucous

TABLE II
BRIEF DETAILS OF 5 CASES OF DILATATION WITH TORSION OF THE ABOMASUM

Case	Breed	Age	Sex	Onset of symptoms, time after parturition		Severity	Operation performed	Direction of torsion	Observations
				Mild	Acute				
1	Guernsey	6 y.o.	F.	3 days	6 days	Acute	+	Clockwise	Slight post-operative improvement followed by gradual relapse. Destroyed *in extremis*. Torsion had recurred. Severe abomasal ulcers present
2	Ayrshire	5 y.o.	F.	1 day	3 weeks	Very acute	−	Anti-clockwise	Moribund on admission. Died a few hours later
3	Friesian	3 y.o.	F.	—	2 ,,	Acute	+	Clockwise	Died 12 hours after operation. Torsion still present. Omasum adherent to diaphragm and abdominal wall.
4	Friesian	2 y.o.	F.	1 day	4 days	Very acute	−	Clockwise	Moribund on admission. Destroyed after examination
5	,,	3 y.o.	F.	1 ,,	3 months	Very acute	−	Anti-clockwise	Moribund on admission. Destroyed after examination

membrane is acutely congested and may show extensive ulceration.

Discussion

There appear to be a number of factors which predispose to dilatation of the abomasum. Bischoff noted that the majority of his cases occurred some 3 to 6 weeks after calving, and suggested that post-parturient alimentary disease and consequent toxin formation cause neuromuscular paralysis of the abomasum, resulting in atony and subsequent dilatation of that organ.

Steere, too, suggested that dilatation is preceded by atony of the abomasum. He considered that changes of food, the stress of parturition and early lactation, abomasal ulceration, and impaction of the abomasum with sand or gravel, are factors predisposing to dilatation. Stenosis or obstruction of the pylorus is another possible cause, and Bischoff described a case of dilatation in which a leukotic tumour had led to pyloric stenosis.

Bischoff also pointed out that once dilatation is established the development of a stenosing kink in the duodenum near the pylorus may lead to a rapid worsening of the condition. This stenosing kink has been observed in each case of clockwise torsion in the present series, but was not present in cases of anticlockwise torsion. It is possible that the development of this kink is the reason for the rapid onset of acute symptoms in the cases of clockwise torsion in the present series as compared with the cases of anticlockwise torsion (see Table II). The number of cases under review, however, is not large enough to be dogmatic in this connexion.

The aetiology of torsion of the abomasum is not fully understood. There appears to be little doubt that the great majority of, if not all, cases are preceded by gross dilatation of the organ and that this is the factor which eventually leads to torsion. The present authors are of the opinion that torsion of an undilated abomasum cannot occur. They have been led to this belief as a result of attempts to reproduce torsion in recently dead cattle. In those in which the abomasum was of normal size they found it necessary first, to rupture the greater omentum in the case of clockwise torsion or the lesser omentum in the case of anticlockwise torsion. Even then it was only with difficulty that the manipulation was performed. In cows which had died of torsion, on the other hand, and in which the abomasum was of course greatly dilated, it was relatively easy to reverse the direction of torsion, that is, to produce anticlockwise torsion in an animal which had died of clockwise torsion, and *vice versa*. These simple procedures would seem to confirm that dilatation of the abomasum and rupture of the greater or lesser omentum are necessary prerequisites for torsion.

What, then, are the factors which lead to torsion of an already dilated abomasum? In the first place it is important to realise that the dilated organ does not lie along the floor of the abdomen as it does in its normal state. Instead, there is a marked tendency for the abomasum to be displaced in an upward direction. This upward displacement was present in the cases of dilatation in the present series, and is implied by Bischoff and Steere who state that the surgical approach to the dilated organ is *via* the right paralumbar fossa. This displacement is, no doubt, due in part to the physical increase in size of the abomasum and possibly also to the marked accumulation of gas which develops dorsally in the organ. That gaseous distension of an organ can lead to its displacement to an abnormal position has been demonstrated by Eek and Hagelsteen (1958), who found that torsion of the stomach in the human infant is the result of an upward displacement of the tympanitic transverse colon, to which the stomach is attached by the gastro-colic ligament. The upward displacement of the abomasum necessarily involves an upward movement of the centre of gravity of the organ with consequent progressive loss of physical stability, *i.e.* the abomasum which normally lies in a state of stable equilibrium on the floor of the abdomen, when undergoing dilatation adopts a position in which its equilibrium becomes progressively less stable. It is the opinion of the authors that eventually a position is reached in which the slightest alteration of the external forces

exerted on the abomasum results in this unstable equilibrium being upset. However, since the abomasum is firmly fixed at one point only, *viz.* the omaso-abomasal orifice, such movement must, in fact, constitute a rotation about this point. The rotation is limited to the vertical longitudinal plane by the rumen on the left and the abdominal wall on the right. The other important factor limiting the degree of rotation is the presence of the greater or lesser omentum, and it seems highly probable that the factor which precipitates rotation into one or other of the torsion positions depicted in Figs. 2 and 3, once the state of unstable equilibrium is reached, is rupture of one or other of the omenta.

The diagnosis of dilatation of the abomasum, whether complicated by torsion or not, is relatively simple, for despite the non-specific nature of the symptoms the presence of the distended abomasum can easily be demonstrated by auscultation in the right flank and in most cases by rectal examination. But how does one differentiate between simple dilatation and torsion? According to Steere this can be accomplished by percussion and auscultation of the area on the right side normally occupied by the liver. In cases of torsion the liver is pushed completely away from the rib cage by the expanding abomasum, thus there are no dull percussion notes due to the liver over this area. In simple dilatation, on the other hand, dull notes are heard over a variable part of this area according to the degree of distension. In Case C of the present series of dilatation, however, although no dull sounds were heard on percussion and laparotomy revealed that the liver had been displaced medially by the abomasum, torsion, in the opinion of the writers, had not yet occurred. The opinion has been expressed above that during dilatation the abomasum undergoes a progressive rotation. This being the case, the point at which torsion can be said to occur is purely arbitrary, since any degree of rotation can be termed "torsion." Thus, whether one agrees with Steere's statement depends on what is understood by the term "torsion." The present writers reserve the term for the condition in which maximal rotation has occurred involving rupture of the omentum, strangulation of blood vessels, and severe congestion of the abomasum and omasum. Accepting this definition, the differentiation between dilatation and torsion, once the distension of the abomasum has been demonstrated, is based simply on the great severity of the symptoms exhibited in cases of torsion compared with the relatively mild symptoms of simple dilatation.

Brief consideration must be given also to the differentiation of dilatation and torsion of the abomasum from other conditions. In the case of dilatation, these include acetonaemia, traumatic reticulitis, ulcerative abomasitis, displacement of the abomasum to the left-hand side of the abdomen, or any of the sub-acute digestive disurbances which affect the cow.

In the case of torsion, conditions requiring differentiation include intussusception or any other acute obstruction of the intestines. In both conditions the clinician's task is greatly simplified by the ease with which the distended abomasum can be demonstrated.

It appears to be the general opinion that the prognosis following surgical intervention is good provided treatment is instituted early (Loje, 1948; Bischoff, Steere). Of the cases under review, 2 of dilatation and 2 of torsion were treated surgically. In the former cases operation was found to be relatively simple and recovery resulted. It must be emphasised that it is important to palpate the fundus of the abomasum when drainage is complete to ensure that it is not impacted with sand or gravel. If impacted material is present, it must be removed otherwise dilatation is liable to recur.

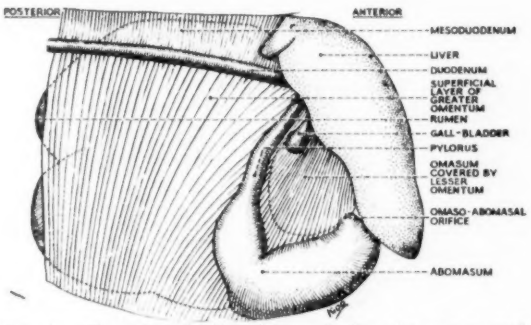

FIG. 1.—The normal disposition of the abomasum and omasum viewed from the right.

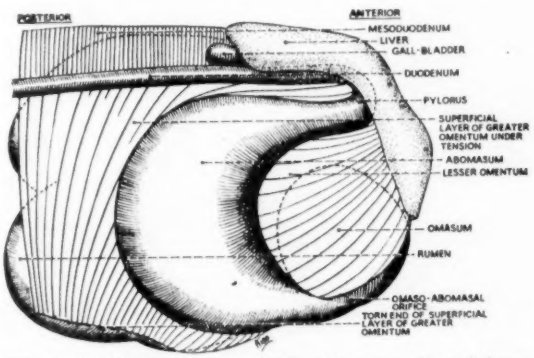

FIG. 2.—Clockwise torsion of the abomasum viewed from the right.

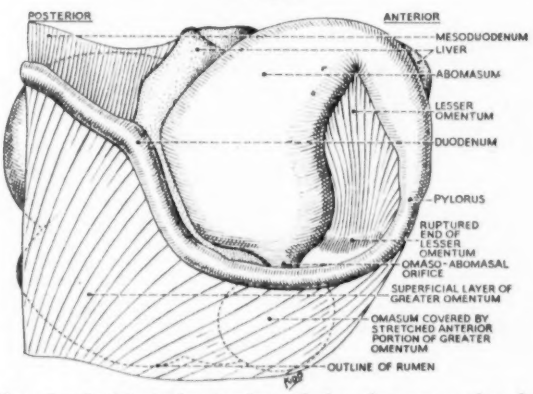

FIG. 3.—Anticlockwise torsion of the abomasum viewed from the right.

With regard to the surgical treatment of torsion it is obviously essential that, before reduction is attempted, the nature of the torsion be recognised so that attempts at correction will be in the appropriate direction. Consideration of Figs. 2 and 3 shows that the direction of rotation may be recognised by observing the position of the duodenum. In clockwise torsion it is high in the abdominal cavity, medial to, and for the most part hidden by, the abomasum, whilst in anticlockwise torsion it sweeps upwards and backwards from the pylorus, low in the abdominal cavity, and lies nearer to the right abdominal wall.

In both cases of torsion in which surgery was attempted the animal subsequently died. Following drainage, great difficulty was encountered in reducing the torsion, because in order to rotate the abomasum into its correct position, it was necessary simultaneously to rotate the omasum upwards from its ventral position on the abdominal floor. (Reference to Figs. 1, 2, and 3 will make this clear.) Although at operation it was thought that torsion had been successfully reduced, subsequent *post-mortem* examination revealed this not to be the case. Even in the dead animal with the right abdominal wall and the last 3 ribs removed, it required 2 people to reduce the torsion.

This serious technical difficulty, together with the shocked state of the patient, makes the successful outcome of attempts at surgical correction in these advanced cases extremely unlikely. It is, therefore, very important that the clinician should recognise the condition of dilatation of the abomasum before torsion occurs, and while the chances of recovery following surgical interference are still relatively good.

Acknowledgments.—Our thanks are due to Professor J. G. Wright for his help and encouragement, and to Mr. P. A. S. Davidson who took the photographs.

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DEPUTY CHIEF OFFICER, P.I.D.A.

Mr. R. A. Mackness, senior research officer in the Farm Economics Branch of the School of Agriculture, Cambridge, has been appointed Deputy Chief Officer of the Pig Industry Development Authority. He will take up the appointment on April 1st. Mr. Mackness joined the research staff at Cambridge in 1946, becoming senior agricultural economist in 1952 and Senior Research Officer in 1957.

Dislocation of the Hip in the Cow

BY

P. R. GREENOUGH

Castle Cary, Somerset

SUMMARY.—During a period of 5 years the author encountered 3 cases of upward luxation of the hip in cows. The dislocations were reduced following a technique described by Hart (1950) *and in each case the manipulation was carried out with ease and with complete success.*

Introduction

EARLY writers such as Frost and Sunderville (1932) and Boyd (1934) regard with disfavour any attempt to reduce a dislocated hip in the cow and the standard text-books of this period support this opinion. Dorso-anterior luxation appears to be more common, the cases described by Boyd, Hart, and by Rham (1959) being of this nature as were the 3 cases encountered by the author. Frost and Sunderville describe downward luxation in which instance the head of the femur enters the obturator foramen; Holroyd (1944) also refers to this condition but no cases are described in detail.

Diagnosis

Two of the 3 cases encountered resulted from an accident at the time of bulling, and the case described by Hart had a similar origin. The appearance of an animal having suffered an upwards luxation of the coxo-femoral joint is quite characteristic. A swelling is present in the gluteal region slightly anterior to and above the acetabulum. The stifle is turned outwards and the hock inwards. When the animal moves she drags the affected limb stiffly up to the unaffected limb but rarely beyond it.

Treatment

The animals treated were deeply anaesthetised with chloral hydrate administered intravenously. The animals were turned on to their sides with the luxated limb uppermost. A rope was passed between the legs and attached to some fixed point, care being taken to ensure that the rope passed around the tuber ischium and tuber ilium thereby fixing the pelvis. The limb was then forcibly extended either with a calving pulley alone or by means of a tractor using low gear, with the pulley used only as a safety release mechanism. As maximum traction became effective an assistant was instructed to pull the hock upwards with one hand whilst at the same time pressing downwards on the stifle with the other. In this way the femur was rotated. At the same time the operator applied thumb pressure to the great trocanter in the estimated direction of the acetabulum. The success of the operation was then clearly felt as the head of the femur clicked into place. This technique follows closely that described by Hart who records no mechanical assistance other than the power of 2 men. From experience with 3 cases it would seem that the amount of force required

varies very considerably. It would appear particularly important to direct the pull on the limb along a line from the great trocanter through the estimated position of the acetabulum. In each case treated the animal was walking completely sound within 48 hours and there was no recurrence of luxation.

Cases Treated

1. *December 14th, 1954.* 7-year-old Shorthorn cow with luxation of the left hip. This dislocation occurred when the animal was riding and very considerable force with pulleys was required.
2. *December 11th, 1957.* 13-year-old Friesian cow also with luxation of the left hip. Riding was the cause of the accident.
3. *October 27th, 1959.* 3¾-year-old Shorthorn with the right hip affected. In this instance it was believed that the animal was knocked down by another cow. The manipulation in this instance was accomplished in a matter of seconds (see Figs. 1, 2, and 3).

A fourth case of suspected luxation was encountered in a 9-year-old Ayrshire cow on July 23rd, 1958, following an accident involving a motor vehicle. On examination the animal did not present the typical appearance described above and a diffuse swelling of the hip region was present. Rectal examination revealed no abnormality. When manipulation was attempted in this case considerable crepitation was audible and successful replacement could not be achieved. It was therefore suspected that the head of the femur was fractured and in fact considerable noise could be heard from the joint for some weeks afterwards. Although this animal remained lame she continued with the herd for a further year.

Discussion

Dorso-anterior luxation of the coxo-femoral articulation can be easily diagnosed and corrected. However, from the literature available it appears that there may be some difficulty in diagnosing other accidents to the hip. In the case of the fractured femur head the limb may not rotate, crepitation is marked, and a diffuse swelling is present over the hip.

When luxation occurs the head of the femur is free to permit the rotation of the limb. Possibly due to muscular pull on the great trocanter, upwards luxation is more common. The head of the femur usually lies in front of the great trocanter thereby causing the limb to rotate and the hock to turn inwards. Holroyd describes dislocation with an outward turning of the hock thereby suggesting that the head of the femur may in some instances lie behind the great trocanter. Several writers describe downwards luxation usually with the head of the femur resting in the obturator foramen and palpable there *per rectum*. Holroyd's technique using a wooden bar to lift the femur would appear to be the technique of choice in these cases.

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FIG. 1.—Case 3 before treatment. Note the swelling of the gluteal region above the right hip and also the inturning of the hock on that side.

FIG. 2.—The repositioning of the hip.

FIG. 3.—The animal 48 hours after the manipulation.

A Surgical Treatment of Septic Fistulae Secondary to Bite Wounds in the Male Cat

BY

GEORGE W. CRIGHTON

Stafford

SUMMARY.—1. *Sites aetiology and clinical appearances of infected multiple fistulae following bite wounds in the male cat are described.* 2. *A rational surgical approach is discussed.* 3. *Results of a series of operations are given.* 4. *A surgical technique to introduce sterile non-absorbent, non-irritant setons is outlined.*

WHILST fighting, the male cat frequently sustains deep penetrating bite wounds especially on the side of the face, over the dorsal aspect of the pelvis and root of the tail, on the tail itself, and on the limbs, particularly on and below the carpus and below the hock. Most of these wounds heal without incident. Many develop into typical abscesses which mature, drain, and then heal permanently. A few, however, become fistulous.

On the surface these lesions appear as several slightly swollen areas, often devoid of hair, each bearing a central opening, sometimes plugged with granulation tissue. On digital pressure a dark coloured haemorrhago-purulent fluid escapes.

Bacteriological examination of a swab shows a mixed infection, whilst microscopical examination of a lesion demonstrates multiple abscess formation with a rich capillary field in association (Campbell).

These lesions are frequently treated by the owners themselves for lengthy periods before the cases are presented. A typical history is that the fistulae appear to heal only to break down after a short time and, because of this characteristic tendency to heal, the lesions are usually well developed and specific before therapy is started.

Pathologists' reports, together with antibiotic sensitivity tests, suggest that this condition should respond to medical treatment. The experience of the writer is that, in well-established cases, medical measures have only limited success. Radical surgery is indicated in some instances, but, since this may be extensive on the one hand or tedious on the other, a more conservative approach would seem advisable. All clinicians will have noted that the skin of the cat heals at a remarkable speed. It is reasonable to assume that other tissues of the cat have a similar property.

Indeed, a cycle of organisation, abscess formation, drainage, reorganisation, etc., can be readily observed if one of the surface lesions is left undisturbed for some time.

If one considers these fistulae as "tubes" filled with a purulent material and lined with organising tissue one can appreciate this lining developing at different speeds so that this "tube" may, from time to time, become loculated giving rise to numerous septic foci. If these foci become true abscesses then they might tend to "point" into the newly formed fragile divisions in the "tube" thus reopening the canal.

If we accept such a series of events then obviously a surgical approach should consist in the introduction of a non-absorbent, non-irritant substance throughout the entire canal so that no loculation can occur and any build-up of septic material will readily pass alongside this substance to drain at the surface if it cannot be absorbed by the body itself. Returning to the concept of a "tube," the presence of a non-irritant, non-absorbent seton should permit organisation to reach a point when the "tube" itself consists only of healthy granulation tissue plus seton, the purulent materials having been absorbed or having drained away. At this stage removal of the foreign body should result in rapid and permanent resolution.

Case Histories

Fourteen cats have been operated on during the past 5 years. Distribution of the lesions was as follows: 3 on the face, 2 over the pelvis, 5 in the interphalangeal spaces, and 4 sinuses of the carpal joints. Two of the carpal sinus cases required reoperation within 48 hours to reinsert the seton. All patients were kept in hospital for at least 10 days. On the tenth day post-operatively the seton was removed. Recovery to date has been prompt and permanent in all cases. In no case has concurrent antibiotic therapy been given.

Surgical Technique

Intravenous pentobarbitone sodium was given in all cases and a strict aseptic technique practised. A probe was introduced into one of the openings and carefully passed along the fistula until it surfaced. Along the probe was passed a straight suture needle of suitable length bearing polythene tubing of suitable diameter. The probe was then passed into all other fistulae and the plastic tubing threaded through so that it wound in and out of all the openings. The free ends were finally tied to prevent the patient from pulling out the tubing. In the case of a sinus of the carpal joint, wider bore tubing was used and in order to draw the tube into the joint, suture material was passed along the tubing, both free ends of this suture material being passed through the eye of a suitable needle which was then passed down the sinus into the joint and pushed through the far side of the joint. Tension on the doubled suture material helped to introduce the tubing into the joint and sinus, whereupon the suture material was gently withdrawn leaving the tube in the sinus. Sinus cases were kept bandaged for 7 days to avoid movement of the tube.

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The R.C.V.S. Council Elections

We publish below brief biographical details of those gentlemen who have been proposed for election. There are at present five vacancies to be filled on the Council of the Royal College. The result of the ballot will be made public towards the end of May.

Mr. J. Allcock, B.V.SC., M.R.C.V.S., was born in 1926 and qualified at the Liverpool School in July, 1948. He was awarded his Bachelor's degree in the same year. While at the University he was secretary and vice-president of the Students Union, president of the Leahurst Society and secretary of the Veterinary Students Society.

He became first an assistant in a North Wales practice and later moved to Bristol, originally as partner to the late E. C. Bovett and since 1955 as partner with Messrs. T. C. Brown and G. S. Smith. He is a Veterinary Officer and Inspector to the Corporation of Bristol under the Diseases of Animals Acts and Pet Animals Acts. Mr. Allcock is an executive member of the local B.S.A.V.A. Committee.

Mr. A. D. J. Brennan, C.B.E., M.R.C.V.S., until recently Deputy Chief Veterinary Officer, Animal Health Division, was born in 1895 in South Africa and was educated at the Royal Belfast Academical Institute and the Dublin Veterinary College. He qualified from that College in 1923.

During the First World War he served in France, was commissioned in the Queen's 4th Hussars and was mentioned in Dispatches. Having seen service for the Ministry in London, Doncaster, Leeds and Carmarthen he was promoted Divisional Veterinary Officer in 1934 and Superintending Veterinary Officer in 1938. His final promotion, to the post of Deputy Chief Veterinary Officer took place in 1946, and he served on the Ministry's Headquarters staff until his very recent retirement. In the Coronation Honours he was raised to the rank of C.B.E.

Mr. E. R. Callender, O.B.E., M.R.C.V.S., a native of South East Durham, is the son of a farmer. He qualified at the Royal (Dick) College in Edinburgh where he became a house surgeon for the year 1923/24. Having seen general practice in Hertfordshire, Mr. Callender joined the Government service in which he is at present a Deputy Regional Veterinary Officer. He was president of the British Veterinary Association 1956/57, and is a member of the Council of the National Veterinary Benevolent and Mutual Defence Society. Mr. Callender is a member of the Faculty of Veterinary Science in the University of Liverpool, and was awarded the O.B.E. in 1953.

Mr. T. A. R. Chipperfield, B.SC., M.R.C.V.S., Barrister-at-law, born in 1911, was educated at Cranleigh School and the Royal Veterinary College, London, where he was a Clement Stephenson Scholar. He qualified in 1932 and gained his B.SC. at London in that year. Having practised at Cranleigh in Surrey from 1933 to 1937, he joined Gray's Inn in 1936 and was called to the Bar in 1946. He was hon. secretary to the Society of Veterinary Practitioners 1938/39, during which time he served on the Council N.V.M.A. and was a member of several Committees, including the Editorial Committee. Mr. Chipperfield set up in practice at Crowborough in 1939, and has resided there ever since.

As a member of the Sussex Division of the B.V.A. since 1940 he has been successively hon. treasurer, hon. secretary and president.

A member of the Sussex Herd Book Society and a breeder of Sussex cattle, he is an official judge of the herd, and was for 2 years chairman of the Council of the Society, prior to election as president in 1952.

Mr. T. Hughes Ellis, F.R.C.V.S., is principal of a general practice at Chwilog, near Criccieth. He qualified at the Royal Veterinary College in 1943, and was awarded his Fellowship in 1957 for work on obsetrics in sheep. He was the 1959 winner of the B.V.A. William Hunting Award.

He is a member of the council of the North Wales Division of the B.V.A. and of the council of the Bangor Animal Health Club. He is a Director of UFAW, and president of its Veterinary Section for 1959/60.

Mr. G. N. Gould, J.P., F.R.C.V.S., has been in general practice since he qualified in 1924. He was a member of the Survey Committee which later became the Technical Development Committee of the B.V.A. He was chairman of the latter Committee from 1946/56. He became president of the B.V.A. in 1945 and was honorary secretary from 1946/49.

Mr. Gould has been a member of the Council of the Royal College continuously from 1944. He served as treasurer from 1953/57 and in the latter year was elected president of the College.

Lt.-Col. J. Hickman, M.A., M.R.C.V.S., was educated in St. Edmund's School, Canterbury, and qualified from the Royal Veterinary College, London, in 1935. He served as house surgeon for one year prior to joining the Royal Army Veterinary Corps in 1936, from which he was permitted to retire in 1947 having attained the rank of Lt.-Colonel. He saw service in India and Europe, and from 1945 to 1947 was seconded to the Control Commission for Germany. In 1947 Colonel Hickman was appointed Reader in Surgery at the Royal Veterinary College, London, and in 1948 obtained an Overseas Visiting Fellowship of the Animal Health Trust. In 1949 he was appointed a Senior Scientific Officer of the Animal Health Trust attached to the Equine Research Station at Newmarket, and in 1952 was appointed Reader in Animal Surgery in the University of Cambridge. He was formerly an examiner in Veterinary Surgery in the Universities of Cambridge, London, Bristol and Liverpool and reserve examiner for the Royal College of Veterinary Surgeons. He has been a member of the Council of the British Veterinary Association, and served as a member of the Editorial Committee of THE VETERINARY RECORD from 1950 to 1957. President of the Eastern Counties Veterinary Society 1959/60.

Mr. J. M. Ingram, M.R.C.V.S., was born in 1905 in Huntly, Aberdeenshire of a farming family, and before undertaking his veterinary studies had practical experience in agriculture. He was educated at the Gordon School, the North of Scotland College of

Agriculture, and graduated from the Glasgow Veterinary School in 1928. After serving as an assistant in several practices he became principal of his own practice in 1938. He was an officer of the B.V.A. for 5 successive years, first as honorary secretary (1953/56), then as junior vice-president, and finally as president (1957/58). He has been a member of the B.V.A. Council since 1947 and has served on a number of Standing Committees. At present he is vice-chairman of the Editorial Committee.

In addition to these offices within the B.V.A., Mr. Ingram's experience has included the presidency of the Society of Practising Veterinary Surgeons, and of the South Eastern Veterinary Association.

Mr. J. H. McGhee, T.D., M.R.C.V.S., is the son of the late Thomas McGhee, M.R.C.V.S., of Tattenhall, Cheshire. He qualified in Edinburgh in 1933, and was engaged in general practice until the outbreak of war. He then served as a Territorial officer in the R.A.V.C. in various overseas theatres, reaching the rank of Lt.-Colonel. In 1948 Mr. McGhee returned to general practice in Warwick becoming president of the Midland Counties Veterinary Association in 1958, and president, Warwickshire Veterinary Club in 1959. He has been a member of council of the B.V.A. since 1955 and is also a member of council of the M.C.V.A. and the Society of Practising Veterinary Surgeons. He was hon. local secretary of the B.V.A. Congress, Leamington Spa in 1956.

Mr. D. W. S. Pettett, M.R.C.V.S., born in Plymouth in 1916, was educated at Plymouth College, and Seale-Hayne Agricultural College. He qualified at Liverpool University in 1940. Returning to Plymouth as an assistant, he became in 1942 a partner in a Barnstaple practice, and is president this year of the Western Counties Division of the B.V.A. He represents the Division on the Council and is a member of the State Veterinary Medicine and Farm Livestock Committees. Mr. Pettett was a member of the Sub-committee which negotiated new Ministry L.V.T. fees in 1957, and is a member of the Society of Practising Veterinary Surgeons. He is keenly interested in rugby football and frequently referees local school matches. A member of the local N.F.U. he is a keen agriculturalist and runs a herd of pedigree pigs.

Dr. Peter David Storie Pugh, M.B.E., M.C., T.D., M.A., M.R.C.V.S., A.R.I.C., of Cambridge, is the son and grandson of veterinary surgeons and was educated at Malvern and Queen's College, Cambridge where he was an Honorary Foundation Scholar and read medicine. After serving with the C.U. Cavalry Squadron he transferred, on the Squadron's mechanisation, to the Queen's Own Royal West Kent Regiment with which Regiment he served for 10 years. He won the M.C. and was wounded with the B.E.F. on the withdrawal to Dunkirk, was appointed M.B.E. in 1945, and was awarded the T.D. in the same year and subsequently 2 Clasps. As a parachutist he commanded the Mortar Battery of 44 Parachute Brigade, and was promoted Lieutenant-Colonel to command the 1st Bn., The Cambridgeshire Regt.

After the war Dr. Pugh spent the years 1946 to 1948 at the Royal Veterinary College, being awarded the Williams Memorial Prize, the Gold Medal for Medicine and Surgery and the Coleman and R.A.S.E. prizes. In 1948 he returned to Cambridge and was placed in Class I of the Natural Science Tripos Part II (Biochemistry), gaining the Queens' Natural Science Prize. He continued at Cambridge to do research in the Department of Animal Pathology under Professor W. I. B. Beveridge as an Animal Health Trust Wellcome Research Fellow, and was appointed in 1953 to a lectureship in Veterinary Medicine in the Department of Veterinary Clinical Studies.

Dr. Pugh was elected to the Council R.C.V.S. in 1956 and is at present vice-chairman of the Parliamentary Committee. For some years he was honorary secretary and treasurer to the Eastern Counties Veterinary Society including acting as local secretary for the B.V.A. Congress in Cambridge. He has served as a member of Council B.V.A. since 1954, and is a member of the General Purposes and Finance Committee and the Technical Development Committee.

Dr. Pugh also farms land in Cambridgeshire and Hertfordshire, his particular interest being the pedigree breeding of sheep and pigs. He serves on the Executive Committee of the local N.F.U. and is a member of the Cambridgeshire Farmers Union Livestock and Pig Committees.

Mr. Alasdair Steele-Bodger, M.A., B.SC., M.R.C.V.S., was educated at Shrewsbury and Caius College, Cambridge where he gained an honours degree in Natural Sciences. He then took a B.SC., as an external degree at Edinburgh University and graduated from the Royal (Dick) Veterinary College. He first worked as an assistant and then took over the Lichfield branch of his late father's practice when he died in 1952.

He is secretary of the Society of Practising Veterinary Surgeons and is a representative of that body on Council B.V.A. serving on the Home Appointments Committee and the General Purposes and Finance Committee. He is on the Executive Committee of the British Small Animal Veterinary Association and chairman of the Midland Region of that Association.

Mr. Harry McIntyre Wilson, M.R.C.V.S., born in 1905, was educated at the George Watson's College for Boys (Edinburgh) and Royal (Dick) Veterinary College, where he qualified in May, 1926. He is at present a member of council and of Standing Committees R.C.V.S., and a member of council of the Scottish Branch of the B.V.A., and the Scottish Metropolitan Division B.V.A. He has served on council and Committees of the B.V.A.; of the National Veterinary Benevolent and Mutual Defence Society; and of the Victoria Veterinary Benevolent Fund.

Mr. Wilson serves also on the Artificial Insemination Committee advising the Secretary of State for Scotland, and on the Committee and Sub-committees advising the Secretary of State on the Model Dairy By-laws. He is a member of the Department of Agriculture for Scotland panel for examination of stallions, and also a member of the Department's Panel of Referees in respect of the licensing of bulls. He has been in general practice since graduating.

Current Literature

BOOK REVIEWS

The Veterinary Annual. Edited by W. A. Pool. John Wright & Sons Ltd., Bath (1959). 42s.

"The Veterinary Annual" breaks new ground in British veterinary literature and in his preface the Editor makes clear the purpose behind the production of this book, namely, to present in concise form a review of advances during the previous year, together with a list of selected references for the period under consideration, in order to facilitate the task facing present day veterinary surgeons, especially those in practice, of keeping up to date with the ever-increasing flow of literature on veterinary science and allied subjects. The concept is admirable and the result excellent. The first, and smaller, part is devoted to short articles on topical subjects of a general nature from all over the world. Each gives a thumbnail sketch of current trends in the veterinary affairs of the country concerned, or of the special aspect of veterinary work dealt with, for example, greyhound racing.

The larger second section is a review of the current literature. Sections are devoted to such topics as diseases related to bacteria and fungi, diseases related to protozoa, diseases related to viruses, parasitology, nutritional and metabolic disorders and a host of others. In most cases several authors contribute, but where the subject is narrow a single writer may suffice. In most cases the literature reviewed covers 1958 and part of 1959 but some authors, in this first volume, have been more liberal in their interpretation and have included earlier references. A full bibliography for the articles mentioned in the text concludes each section.

Finally, the Editor lists drugs and appliances which have become available during the past year, with information supplied by the makers ; also a list of English veterinary works and new editions published during the same period.

It is difficult to think of any book which supplies in such readily available form so much information on where to obtain further information on any given subject, in our view a most vital service to the profession. Doubtless there are omissions but, in view of the overall value of the book, it would indeed be a captious reviewer who sought them. The more one looks at "The Veterinary Annual," the more difficult it is to imagine one's bookshelves without it.

Tiergeburtshilfe. Richter-Gotze. Edited by Professors Rosenberger and Tillmann. Paul Parey, Berlin. Second edition (1960). D.M.178.

This monumental work is much more than a textbook of obstetrics since it covers normal pregnancy, birth and the puerperium, and also the diseases of the newborn and suckling animal.

The first edition, by the late Professors Richter and Götze, was briefly reviewed in this journal in 1950. The new edition has been extensively revised and brought up to date and the text and illustrations are increased to the extent of about 60 per cent. Ten further contributors have provided chapters in their own specialities, making 14 contributors in all, from Germany, Austria, Denmark, Belgium, Italy and the Netherlands. They include such well-known names as Benesch, Küst, Lagerlof, Liess, and Vanderplasche.

After a short historical introduction, the first main section of the book deals with the reproductive organs of the female, the changes that occur in normal pregnancy, the processes of normal birth, and the normal puerperium. This occupies some 170 pages and is richly illustrated with photographs and drawings. The next section is the largest, some 560 pages, and covers the pathology of pregnancy, parturition and the puerperium. The final main section is devoted to diseases of the foetus, the newborn animal and the suckling. A short minor section on the obligations of the veterinarian attending pregnant and parturient animals and the precautions he should take completes the book.

This is not a student's book but an encyclopaedic reference volume and it costs about £15. It is now produced by Paul Parey and conforms to their customary high standard of paper, printing and binding. There are many hundreds of references taken from the world literature up to 1958. Hypomagnesaemia, for instance, occupies 15 pages of text, with 5 photographs and over 100 references. Caesarean section occupies over 20 pages and includes over 40 photographs, together with drawings. Not all the illustrations seem to the reviewer to fulfil a really useful purpose ; examples are the coloured plates showing various bacteria in films stained by Giemsa. The same criticism applies to a variety of instruments and pieces of apparatus which makers' catalogues illustrate in abundance.

To attempt to review such a work as this in detail would be like reviewing a volume of the "Encyclopaedia Britannica." Every reader with an interest in some part of the very wide field covered must inevitably find information of interest and value : if he is himself an expert he will also find things to criticise. Even if a potential reader knows no German he can still spend profitable hours with the photographs and drawings.

This book represents a tremendous achievement and continues the tradition of the great German works of the past, such as Ellenberger and Baum's textbook of comparative anatomy. No one who works in the field of veterinary obstetrics and who has even the slightest working knowledge of German can afford not to consult this book.

BOOKS RECEIVED

Poultry Nutrition, Bulletin No. 174, by W. Bolton, D.SC., F.R.I.C., F.R.S.E. H.M.S.O., London (1959). 5s.

Vitamin B_{12}, by E. Lester Smith, D.SC., F.R.S. Methuen & Co. Ltd., London (1960). 15s.

My Year with the Woodpeckers, by Heinz Sielmann. Barrie & Rockliff Ltd., London (1959). 21s.

The Inspection of Food (A Handbook for Students of Public Health, Agriculture and Meat Technology), by H. Thornton, B.V.SC., M.R.C.V.S., D.V.H., F.R.S.H. Baillière, Tindall & Cox. Ltd., London (1960). 2nd edition. 15s.

News and Comment

THE BRITISH UNITED PROVIDENT ASSOCIATION

The Council of the B.V.A. has decided to form a group within the B.U.P.A. as an additional service for members of the profession residing in the United Kingdom.

The B.U.P.A. was formed in 1947 under the presidency of the Rt. Hon. Viscount Nuffield to assist subscribers and their dependents with the cost of the private treatment for illness and accident. Registration with the B.U.P.A. relieves anxiety by providing the means to have treatment under the most favourable conditions. During the past 12 years this Association has expanded rapidly and now gives protection to over 750,000 people in the United Kingdom. No doubt many members already subscribe as individuals, and provided they are under 65 years of age and enrol in Scales 7 to 11, they may transfer to the Group now being formed and continue their membership on advantageous terms. Others, who are not yet members, will be able to join on similar terms, which include a 20 per cent. reduction on standard subscriptions and immediate entitlement to benefit without any waiting period.

There are 3 age groups and 5 scales of benefit designed to give adequate cover throughout the United Kingdom. For example, a man between the aged of 30 and 49, by paying an annual subscription of £9 16s. can obtain grants of up to 24 guineas a week for accommodation in a hospital or nursing home, 80 guineas for each major operation (irrespective of number), and many other benefits up to a maximum in any one year of £650. It is a feature of B.U.P.A. that it provides a family service; the same man can include his wife in the registration for a further £4 17s. per annum and she will then be entitled in her own right to exactly similar benefits; further, he can include all his children under 18 years of age for an additional total cost of £3 5s. per annum and each of them will receive the full scale of benefits. As mentioned above, other seales provide higher or lower benefits, at appropriate rates of subscription. Payment of subscriptions will be quarterly in advance by Bankers Order; there will be a 5s. charge to cover the cost of administration.

The benefits are available whilst a subscriber or his dependents are in the United Kingdom or temporarily abroad on business or holiday; if treatment is received in hospital under the National Health Service, the subscriber is eligible for a special grant for other expenses connected with the illness, such as convalescence. Cover against the fees of a private general practitioner can be secured by the payment of an additional subscription.

The Council was impressed by the low expense ratio (about 10 per cent.) on which B.U.P.A. operates, the high claims rate (about 85 per cent.) and the continuity of cover given to all subscribers from year to year. Members who would like further details about the Group including the rates of subscription, tables of benefits, and how to join, should write to the Accountant, British Veterinary Association.

NEW REGIONAL A.I. PROJECT

It was announced on February 25th by the Milk Marketing Board that a pilot bull breeding scheme involving only 12 to 15 progeny-tested Friesian bulls is now to be employed to cover A.I. service with this breed in the north of England. If successful it may be that only 200 proven bulls would be used to service 2,000,000 cows in the national commercial herd. In view of the vitally important points concerned with breeding, fats, and solids-not-fats, this scheme, which will be the concern of L. K. Hunter, M.R.C.V.S., Regional Chief M.M.B. Veterinary Officer in the North, opens up a new vista in producing better stock and even more nutritious milk. All concerned will wish every success to this progeny testing, which is not intended to be a saving on the bull stud or raising difficulties for pedigree breeders, but simply a pilot scheme to investigate the modern approach to breeding, testing and selection of bulls on a large scale through the assessment of their characters. It should provide more profitable aid than at present exists for commercial farming and should also mean satisfactory reserves of bulls can be built up.

THE KEITH ENTWISTLE MEMORIAL LECTURE

The first Keith Entwistle Memorial Lecture was delivered by Sir George Pickering, Regius Professor of Medicine at Oxford University, in the Old Library, Pembroke College, on February 16th. The subject of the lecture was "Fever." Those present included Mr. and Mrs. A. Entwistle, Professor L. P. Pugh, members of the staff, recent graduates, students, and other personal friends.

In introducing the speaker the President of the Cambridge University Veterinary Society paid tribute to the work and memory of Keith Entwistle both in the Society and as a fellow student.

Professor Pickering opened his lecture with a review of the physiology of temperature control. He then went on to explain recent developments in the study of pyrexia with particular reference to work carried out in his own Department and the nature of the action of bacterial pyrogens. He explained how intercurrent disease in experimental animals had proved a considerable handicap.

The lecture stimulated an interesting discussion on the antigenic and immunological actions of these pyrogens, and the possible value of disease-free experimental animals in subsequent research.

The evening, with its theme of comparative medicine, was a fitting tribute to one whose interests were so wide.

THE CORNWALL VETERINARY CLINIC CLUB

The inaugural meeting of the Cornwall Veterinary Clinic Club was held at the Royal Hotel, Bodmin, on February 24th. Mr. A. V. H. G. Abbott, of Bodmin, explained to those present that the club was formed to enable veterinary surgeons to meet periodically to discuss professional and general items of interest. He said that the veterinary profession

played an important part in the advancement of agriculture and the promotion of public health, especially regarding meat and milk production, and it was hoped the club would aid in this work.

The chairman of the club is Mr. P. Hobbs, of Camborne, and he, with the other veterinary surgeons, were accorded a civic welcome by the Mayor of Bodmin, Mr. George Smith.

FOX ENCEPHALITIS: M.F.H. ENQUIRY

The sub-committee set up by the Masters of Foxhounds Association to enquire into the epidemic which has been killing foxes in various parts of East Anglia has asked the Animal Health Trust to become its professional advisers. It will be remembered that the Trust's Canine Health Centre was the first to diagnose the disease as fox encephalitis.

Announcing its acceptance of the task, the Trust emphasises its need for carcases of newly dead foxes upon which to carry out *post-mortem* investigation, and asks finders of such carcases to send them as quickly as possible to the Canine Health Centre, Kennett, near Newmarket, Suffolk.

Decomposed corpses are of little use for this purpose; those most likely to yield valuable scientific evidence are those which have been freshly shot after showing the characteristic symptoms of the disease—aimless wandering in circles and apparent blindness. It would be even more helpful if foxes displaying these symptoms could be caught and delivered direct to the Centre while still alive.

THE PHYSIOLOGICAL SOCIETY

We are asked to add the following to last week's note on the Physiological Society. Included in the closed-circuit television was a demonstration by Mr. Tavernor, who demonstrated the clinical use of intravenous succinylcholine chloride as a casting agent in horses. The closed-circuit television was provided by Messrs. Smith, Kline and French Laboratories Limited as stated, and also by Smith, Kline and French Research Institute.

UNIVERSITY NEWS

Liverpool

The annual ball of the Liverpool University Veterinary Society was held in the Students' Union on February 26th from 8 p.m. to 2 a.m.

The guests, members of staff, and many graduates and students enjoyed a very pleasant evening which included an excellent dinner, cabaret, and dancing.

MR. HUBERT GILLMOR

Mr. A. L. Wilson writes:—

By the death of Hubert Gillmor on February 7th at the age of 72, the profession has lost one of its ablest men; one more of that ever-decreasing number to whom the horse and horsemanship were almost second nature.

Mr. Gillmor was born in Co. Leitrim, Eire, and qualified M.R.C.V.S. at Glasgow Veterinary College in 1908. After a period as assistant to Mr. A. B. Tully of Kelso he came to Ayr in 1909 where he became assistant and later partner to the late Mr. W. A. Macgregor. Mr. Gillmor married Mr. Macgregor's daughter and the family association was continued later when Mr. W. Alastair Macgregor joined the practice as a partner.

Mr. Gillmor gave unsparingly of his time to furthering the interests of his chosen profession and early recognised the value of forming a professional association among local veterinarians to discuss matters of common interest. When the Ayrshire Veterinary Association, which later became the Ayrshire Division, was founded in 1918, Mr. Gillmor was the first vice-President and was elected to the presidency on several subsequent occasions. He was also President of the Scottish Branch in 1936/7 and served on several of the Branch's sub-committees at a time when many important discussions were taking place concerning national schemes for the control of disease. During the early 1920's and later, Mr. Gillmor took a very active part in the drive for clean milk production and the eradication of tuberculosis from dairy herds in Ayrshire. The minute book of the Ayrshire Division of that time bears witness to the wisdom with which he conducted many negotiations during a difficult period.

Although Mr. Gillmor enjoyed his game of golf and was a member of the Prestwick St. Nicholas Club, his principal hobby was hunting. He always kept a hunter or two and rode regularly with the Eglinton Hunt of which he was a member. His knowledge of horses was probably unsurpassed and his experience was recognised by many authorities. He was veterinary surgeon to Ayr Race-course for meetings held under the auspices of both the Jockey Club and the National Hunt and also attended many of the local point-to-point meetings in an official capacity. Perhaps the greatest tribute to his wide experience was his appointment as chief veterinary surgeon to the Horse of the Year Show at Harringay and the International Horse Show in London.

Mr. Gillmor served in the Royal Army Veterinary Corps during the First World War and was veterinary officer with the rank of major to the Ayrshire Yeomanry from 1920 until the regiment was mechanised in 1941. His association with the regiment was, however, continued, and he always looked forward to meeting old friends at the annual reunions and commemoration services.

Of Hubert Gillmor's many attributes, modesty and kindness, allied to an old-world graciousness, were the qualities that endeared him to everyone. Many students who "saw practice" in Ayr will recall with gratitude the trouble he took to impart his knowledge to them and understand their problems, domestic as well as professional. Unusual situations appealed to him and his recollections of these, told with a delightful Irish accent, made the situations even funnier. We have lost a great friend and colleague but have gained much from knowing him. Mr. Gillmor is survived by his daughter Nancie, who has always shared her father's love of horses and to whom our thoughts turn in her bereavement.

The funeral took place at Ayr Cemetery on February 10th, the service being conducted by the Rev.

W. P. Howat, Minister of Ayr Auld Kirk. A very large number of people attended, including the Earl of Eglinton and Lord Glenarthur and other representatives of the various groups and bodies with which Mr. Gillmor had been associated. Among the many members of the veterinary profession present were Mr. A. Munro Urquhart, Regional Veterinary Officer, who represented Mr. J. N. Ritchie, C.B., Chief Veterinary Officer; Mr. D. S. Barbour, Deputy Chief Veterinary Officer; Mr. Alex Thomson, representing the President of the British Veterinary Association; Dr. P. S. Blackburn, President of the Ayrshire Division; Dr. W. A. Greig, who represented the University of Glasgow Veterinary School and the West of Scotland Division; Dr. W. R. Kerr from Belfast; Mr. R. R. Macrae from Perth; Mr. A. Campbell from Stokesley; and Mr. A. L. Wilson, who represented the Scottish Branch and the West of Scotland Agricultural College.

CAPTAIN CANTRELL TRACY

Mr. A. S. Harris writes:—

Those of us who were privileged to work at Merklands, Glasgow, under the late "Paddy" Tracy are indeed sorry to learn of his recent passing.

We shall all remember his manner of quiet efficiency in the office and lairage, but above all his charming hospitality and that of his wife at their home in Helensburgh. Many of us spent many happy hours either at his home, talking with him into the early hours of the morning, or in his motor boat on Loch Lomond.

To his wife, Jean, and son, Michael, we extend our heartfelt sympathy in their great loss.

R.C.V.S. OBITUARY

We record with regret the death of the following member of the profession:—

JONES, William, Milburn, P.O. Box 18, Highlands Rail, C.P., South Africa. Graduated December 20th, 1907, at the Royal Veterinary College, London. Died January 16th, 1960.

PERSONAL

Births

MCCREADY.—On February 21st, 1960, to Evelyn, wife of Peter H. McCready, M.R.C.V.S., a son, Gordon Robert.

NEEDHAM.—On February 19th, 1960, to Daphne, wife of Brian Needham, B.V.SC., M.R.C.V.S., of Stratford on Avon, a daughter, Rachel Ann.

POCOCK.—On February 28th, 1960, at the Royal Bucks Hospital, Aylesbury, to Angela (*née* Tresidder) and Eric Pocock, B.SC., M.R.C.V.S., a son, John David William.

COMING EVENTS

March

7th (Mon.). Meeting of the Yorkshire Division in the Talbot Hotel, Malton, 8 p.m.

9th (Wed.). Meeting of the Southern Counties Veterinary Society at the Royal Hotel, Winchester, 7.30 p.m.

General Meeting of the South-East Midlands Veterinary Association at Franklins Gardens Hotel, Northampton, 7.30 p.m.

Meeting of the Staffordshire and Derbyshire Veterinary Club at the White Hart, Uttoxeter, 7.30 p.m.

10th (Thurs.). Meeting of the Essex Veterinary Society at the Essex Institute of Agriculture, Writtle, 7.30 p.m.

11th (Fri.). Meeting of the Midland Counties Veterinary Association at the Birmingham Medical Institute, 36, Harborne Road, Birmingham, 7.30 p.m.

16th (Wed.). Meeting of the North Wales Division at the School of Agriculture, University College of North Wales, 2 p.m.

Meeting of the R.S.M. Section of Comparative Medicine at 1, Wimpole Street, London, W.1, 5 p.m.

23rd (Wed.). General Meeting of the Lancashire Veterinary Association in Preston, 2.30 p.m.

Spring Meeting of the Society of Women Veterinary Surgeons at The Priory, Thurgarton, 2.30 p.m.

April

2nd (Sat.). 14th Annual Dinner of the B.R.X. Club at the Royal Veterinary College, London, N.W.1, 6 p.m.

7th (Thurs.). 12th Meeting of the British Veterinary Poultry Association at the Royal Veterinary College, Camden Town, N.W.1, 11 a.m.

9th (Sat.). Symposium of the Forensic Science Society at Guy's Hospital Medical School.

30th (Sat.). Meeting of the N.W. Region of the B.S.A.V.A. at the Queen's Hotel, Manchester, 7.30 p.m.

August 28th to September 3rd. 78th Annual Congress of the British Veterinary Association in Glasgow.

B.V.A. COMMITTEE AND COUNCIL MEETINGS IN EDINBURGH

Tuesday, April 19th
Late Evening. Finance Sub-Committee.

Wednesday, April 20th
10 a.m. Small Animals Committee.
12 noon. Home Appointments Committee.
2.15 p.m. Veterinary State Medicine Committee.
4 p.m. Parliamentary and Public Relations Committee.

Thursday, April 21st
10.30 a.m. Farm Livestock Committee.
2 p.m. General Purposes and Finance Committee.

Friday, April 22nd
10.15 a.m. Council Meeting.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Ayr. Knockshinnoch Farm, Rankinston (Feb. 23); Whitehall Farm, Dailly, Girvan (Feb. 24); Middleton Hill Farm, Mauchline (Feb. 29).

Dumfries. Bogfoot, Crocketford (Feb. 29).

Lanarks. Cambwell Farm, Skirling, Biggar (Feb. 29).

Lancs. Aulthurside Farm, Broughton-in-Furness (Feb. 26).

Perth. Wester Cairnie Farm, Forteviot (Feb. 24).

Staffs. Alverton Hall, Denstone Uttoxeter (Feb. 26).

Suffolk. Manor Farm, Little Bealings, Woodbridge (Feb. 29).

Wigtown. Low Auchneel, Stranraer (Feb. 29).

Fowl Pest

Berks. 175, Nine Mile Ride, Wokingham (Feb. 26); 189, Nine Mile Ride, Wokingham; 1, Gorse Ride, Barkham Ride, Wokingham (Feb. 27); Gorse Cottage, Gorse Ride, Finchamptsead, Wokingham (Feb. 28); Little Folly, Edneys Hill, Wokingham (Feb. 29).

Essex. Gorewell Hall, Tollesbury, Maldon (Feb. 27); Rutland, The Drive, Eastwood Road, Rayleigh (Feb. 29).

Hants. Atners, Town Lodge, Stockbridge; 1, Pound Road, Overwallop, Stockbridge (Feb. 26).

Kent. Pear Tree Close, Broomfield, Herne Bay; 10, Sweechbridge Road, Hillborough, Herne Bay; Revels Farm, Chestfield (Feb. 25); Old Tree House, Hoath, Canterbury; The Old Vicarage, Tonge, Sittingbourne (Feb. 29).

Lincs. Premises off Brackenbrough Road, Louth; 43, Brackenbrough Road, Louth; 47, Brackenbrough Road, Louth; 31, Jubilee Crescent, Louth; Mareham Road Farm, Horncastle (Feb. 23); The Factory Yard, Elmhurst Road, Horncastle (Feb. 24); Park View, Lincoln Road, Horncastle (Feb. 27).

Middlesex. New Farm, Ashford Road, Laleham, Staines (Feb. 29).

Norfolk. Broiler Plant, Ormsby; Rectory Farm, Hingham, Norwich; Norfolk School of Agriculture, Easton Hall, Easton, Norwich; 1, Council Houses, Wickmere, Norwich; Glencairn, Letheringsett, Holt; Allotments, Jellicoe Road, Great Yarmouth (Feb. 23); Riverside Farm, Loddon, Norwich; The Mill House, Stokesby, Great Yarmouth; Fairhaven, Post Office Lane, Saxthrope, Norwich; 21, Woodfield, Briston, Melton Constable (Feb. 25); Bayfield, New Hainford, Norwich; Landscape, New Hainford, Norwich (Feb. 26); Swiss Cottage, Cromer Road, New Hainford, Norwich; The Vale, Kirby Bedon, Norwich; Yew Tree Farm, The Melthorpe, Dereham (Feb. 28); Eagle Farm, Low Common, Bunwell, Norwich; Opposite Post Office, Reepham Road, Bawdeswell, Norwich (Feb. 29).

Letters to the Editor

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

GENERAL

The Relationship Between Age of Bull, Age of Semen, and Fertility

Sir,—In connexion with Mr. D. H. L. Madden's recent letter (*Vet. Rec.* **72.** 153) in which he raises the question whether the poor fertility of old semen is due to embryonic death or fertilisation failure, we have some figures which may help to clarify the issue. The data has been collected in field surveys carried out at Dartington Hall Cattle Breeding Centre and at Somerset Cattle Breeding Centre for the Private Centres' A.I. Group, with the financial help of the Agricultural Research Council.

In field studies, one practical indicator of embryonic death is the length of the interval between inseminations. It is assumed that the interval corresponding to one oestral cycle (18 to 24 days) represents failure of fertilisation or very early embryonic death, whereas intervals of abnormal length (25 to 35 days and more than 48 days) may be the result of fertilisation followed by embryonic death. Irregular oestrous cycles can, of course, occur irrespective of fertilisation.

We have compared the intervals following first insemination with "fresh" semen (up to 36 hours old), with "old" semen (more than 36 hours old), and with deep-frozen semen. It can be seen in the Table, in which all the data is based on calving conception rates, that the conception rates with "old" and deep-frozen semen are considerably poorer than with "fresh" semen. It is also clear that there are more "normal" intervals following insemination with "old" and deep-frozen semen than with "fresh," indicating a greater incidence of fertilisation failure or very early embryonic death in the "old" and deep-frozen group.

In a field survey it is impossible to say whether the "normal" return to insemination intervals represents fertilisation failure or very early embryonic death but the work of Kidder *et al.* (1954) and Bearden *et al.* (1956) favours fertilisation failure. These workers slaughtered cows which had been inseminated with semen from bulls of low and high fertility and found that the low-fertility bulls had poor fertilisation rates and that there was very little difference in the embryonic death-rates in the 2 groups.

Until further experimental evidence is available

COMPARISON BETWEEN "FRESH" SEMEN (UP TO 36 HOURS OLD), "OLD" SEMEN (MORE THAN 36 HOURS OLD) AND DEEP-FROZEN SEMEN IN RELATION TO FERTILITY AND THE LENGTH OF INTERVAL BETWEEN FIRST AND SECOND INSEMINATIONS
(This data was collected between 1956–8 and is confined to Friesians and artificial inseminations results only, any natural services being excluded)

Semen	Number first inseminations	Percentage pregnant	Interval between first and second insemination (days). Number of animals expressed as percentage					
			Less than 18	18–24	25–35	36–48	More than 48	Total
"Fresh" ...	4,270	63·3	3·2	44·5	9·6	17·1	25·7	1,473
"Old" ...	559	51·2	5·4	49·0	10·4	15·8	19·3	259
Deep frozen ...	656	46·3	3·7	53·7	7·5	18·7	16·4	348

there seems no reason to postulate that the cause of poor fertility obtained with "old" semen differs greatly from that following the use of deep-frozen semen or the semen of low-fertility bulls.

Yours faithfully,

HUGH BOYD.

Dartington Hall Cattle Breeding Centre,
Totnes,
Devon.

HUGH C. B. REED.

Somerset Cattle Breeding Centre,
Ilminster,
Somerset.

February 29th, 1960.

References

BEARDEN, H. J., HANSEL, WM., & BRATTON, R. W. (1956). *J. Dairy Sci.* **39.** 312.

KIDDER, H. E., BLACK, W. G., WILTBANK, J. N., ULBERG, L. C., & CASIDA, L. E. (1954). *Ibid.* **37.** 691.

"Progress"

Sir,—Further to my letter of February 20th, I feel that I owe an apology to Connaught Laboratories, University of Toronto, for my last remark in the paragraph concerning distemper/hard pad vaccines. This manufacturer has the courage to state openly that a second dose of his product* should be given some 2 months after the primary vaccination.

Yours faithfully,

R. HANSCOMB.

Cobwebs,
West Wickham,
Cambridge.

February 22nd, 1960.

* Disvax.

Sir,—I regret not replying to Mr. Vaughan's letter on the above subject before, but I have been on holiday.

I do not agree with him that "non-ethical" companies carry out better standardisation of drugs, or research for new drugs. I obviously cannot quote names because it would be improper to do so, but I definitely am aware of the fact that those firms who deal almost entirely with our clients do the least standardisation and research, and usually their representatives leave my premises with small orders and glum faces.

I hasten to add that I do not include here those firms who sell "run-of-the-mill" chemicals or "the drench" to clients.

If Mr. Vaughan reads my previous letter again he will see that I refer only to prohibition of the sale to the public (with a few exceptions) of *injectable* drugs —I have no axe to grind over any of the items which he mentions.

I leave the matter of Mr. Vaughan's part-time advisory appointment to his own conscience—it seems the firm by whom he is employed does not turn out items about whose sale to the public we are particularly concerned.

As regards his written advice to clients of his firm I have always thought it was an understood thing that one never recommended or gave drugs where a fresh case was concerned without first visiting the animal and personally diagnosing the disease!

In conclusion I would like to repeat what I wrote in my last letter—that to put this profession's private practices back on a firm economic basis we must alter the regulations to prevent the sale to the public of all but a few injectable drugs; we must see to it that poor people's animals are adequately attended to by *qualified* private veterinarians working on a chit system from the charitable associations; we must demand professional discounts identical to trade discounts from all veterinary firms; and finally we must make our controlling bodies "stir their stumps" and get to work on these things for us.

Yours faithfully,

R. HODDINOTT.

Mill Pond House,
Hayle,
Cornwall.

February 22nd, 1960.

Sir,—I would like to enlarge a little upon Mr. Hoddinott's remarks (*Vet. Rec.* **72.** 92) concerning those firms which pursue what they rightly call an "ethical policy" in the distribution of their products and those who do not.

Many years ago the B.V.A. and, I think, the Pharmaceutical Society and others came to an agreement whereby certain biological products, particularly sheep biologicals and blackquarter vaccines, could rightly be sold by chemists as well as supplied by veterinary surgeons. The idea of the original agreement was to see that retail chemists, particularly those who supplied farmers, should have a fair share of business; it was also hoped to obviate any criticism from the farmer that he was not being well served by our profession in those districts which carried a heavy sheep population and which, at that time, were ill-supplied with veterinary surgeons.

To-day the position is quite different. No longer are there any districts ill-supplied with veterinary surgeons. To-day the country chemist is having his business in this direction taken from him by ever-increasing farmers' co-operatives who set up their own pharmaceutical departments for this very purpose. The matter of the distribution of these and other chemical products has now reached the proportions of a farce. Some of these farmers' co-operatives obtain supplies through their chemists, but in fact most of the selling is done through ordinary lay salesmen who know little about the products they are selling. Now this trade must be becoming hot. Recently a client of mine who is a very substantial sheep farmer told me that the reason why he bought his sheep biologicals from the co-operative was that the salesman gave him a cash discount on his purchases. This is presumably in addition to any dividend to which he is entitled. I suppose the salesman was giving a share of his commission. I informed the farmer that I could supply at a competitive figure but we parted on the question of cash discount. I am afraid I am not sufficiently "progressive" to do business on these lines which could involve matters like tax evasion.

For years I have wondered at the firms who pursue an ethical policy with our profession on these matters. It has seemed to me that they were backing a losing horse. Now I am not so sure. It appears that there is an awakening in the veterinary profession which may pay dividends. For my part I will go to great extremes to avoid making any purchases through firms which pursue a policy which I do not think ethical and I am not prepared to let the B.V.A. or any other body decide this point for me. There is "a song in my heart" each time I find one of my ethical firms producing something which has hitherto been the sole property of my "unethical" firms.

Some years ago I asked my small daughter what she considered a good family motto. She replied "*nemo me impune lacessit*." The motto was adopted with acclaim.

Yours faithfully,
J. P. PICKERING.

Orchard House,
Priestpopple,
Hexham,
Northumberland.
January 30th, 1960.

Sir,—The letter from Mr. R. Hanscomb in your issue of February 20th raises what is the question of the moment for small-animal practitioners. The commercial scramble for the canine vaccine market has many disturbing features as he has shown. It is trade competition running riot, and a waste of research effort. In my view this is private enterprise at its worst. If we can believe their sales-talk each of the contending groups have spent years in isolated research projects to produce an article already available for years in a useful and probably superior form. They waste years of effort repeating a job already very well done by a most reputable group from a publicly organised national effort.

And what a coincidence is here! All these separate research programmes by different firms in different countries reached their self-acclaimed success and came on the market at the same time. To profit from the tremendous demand created by the sound success of the pioneer firm?

Already heads are falling in the vaccine war. Changing names may signify burnt fingers. Miss Fardell's exposure of the sale of so-called distemper preventives to the public is indeed timely. Most of the combatants will lose the fight and then where may they look to unload the fruits of their research? Who could stop a powerful commercial group should they decide to carry their cut-throat competition to the chemist's counter? *They* have no guide to professional conduct.

Since by their own admission so much seems to be available for commercial research, when can we expect any similar effort to produce a vaccine against *cat* distemper? A planned and co-ordinated joint research programme could probably have provided protection for this species by now had the profit motive been less dominant.

The proposal of an independent vaccine-testing project by the Animal Health Trust is worthy of consideration. Their mark of approval obtainable only after the strictest trials would give us more confidence in the products we inject into our patients.

Yours faithfully,
JOHN M. MITCHELL.

101, Sternhold Avenue,
Streatham,
London, S.W.2.
February 20th, 1960.

Sir,—I most heartily agree with your correspondent, Mr. R. Hanscomb, regarding canine vaccines. Last summer we experienced a very serious outbreak of distemper/hard pad in our practice and unfortunately quite a considerable number of dogs which had been immunised with an egg-adapted vaccine within the past 2 years contracted the disease. That the infection was, in fact, distemper/hard pad was confirmed by laboratory investigation, either by injection of ferrets with brain emulsion or spleen emulsion from dogs which had died from the disease or by blood samples taken from dogs which were actually ill.

As a result of this experience I consulted most of the leading authorities in the country regarding various aspects of distemper/hard pad infection and immunisation. The variance of opinion was not only amazing, but alarming. These opinions were, however, sought in confidence and I therefore do not propose to divulge their source. It would perhaps be helpful to your readers if I gave a synopsis of the conclusions which we reached from the general opinions expressed.

Storage of vaccine. Probably insufficient care is often taken over the storage and handling of vaccine. One cannot be sure of the preservation of the live virus content unless the vaccine is stored at a temperature of 3° or 5° (obtained in the usual household refrigerator—not the ice compartment). Fluctuations in temperature can be more lethal to the vaccine than a higher temperature, and on no account therefore should vaccine be carried as stock in a motor-car. If it is necessary to carry it for any length of time on a round, it is now our policy to carry it in a wide-mouthed thermos flask containing ice as used by inseminators in the transport of semen. Also, there is obviously considerable risk of inactivation of vaccine by the use of detergents or spirit in syringes, and recently we have adopted a policy of using special nylon syringes for this purpose which can be readily identified as a further precaution against this risk.

The duration and assessment of immunity in a vaccinated dog. It was first claimed that immunity from an egg-adapted vaccine was life-long, but more recently this claim has been amended by one firm to "lasting immunity" whatever that may mean. Further doubt is now being put into the clinician's mind by the same firm printing a notice on their vaccination certificate counterfoil instructing the veterinary surgeon to inform the owner that "the injection of the vaccine and the issue of the certificate

is not an absolute and unqualified guarantee that the dog will be completely immune to canine and distemper virus infection." This is completely contrary to the advertising policy of the firm in question and it is a little difficult to understand why it has not been printed on the actual certificate. When the vaccine was first put on the market, why was a claim made that immunity would be life-long when there appears to be no experimental evidence whatsoever that this is the case?

It now seems to be the opinion of the majority of the experts in this country that although a high proportion of dogs do develop immunity after vaccination, immunity is not likely to last more than 12 months if the dog does not come in contact with natural infection. In view of the isolated life led by most country dogs this information is, of course, of the utmost importance.

Apparently it is possible to tell the degree of immunity at any period after vaccination by assessing the neutralising antibody titre. Why experimental work to substantiate the claim of life-long or lasting immunity has not been carried out in the field is beyond my comprehension, and there is obviously a very great need for such an investigation to be made without delay.

It is now the policy in this practice to advise owners that unless a vaccinated dog is allowed to mix with other dogs it is advisable to have the dog revaccinated after 12 months. We also advise owners that the claims made regarding lasting immunity in advertisements in the Press and on television are presumably intended for owners of dogs in cities as opposed to those in the country. It is very surprising how understanding and appreciative owners are when given such advice. Whether even further doses of vaccine are necessary in the natural life of a dog we do not know.

The hard pad myth. The majority of experts agree that it is impossible to differentiate between the distemper and so-called hard pad diseases even in the laboratory. Apparently there is no serological method of differentiating the 2 diseases, and one strain of virus used in the egg-adapted vaccines gives immunity to both conditions. It is obvious to many clinicians that hard pad is only a clinical manifestation of distemper, and it is unfortunate that the words "hard pad" were ever evolved.

I have purposely made no reference at this juncture to the problems associated with virus hepatitis and leptospirosis, including the debatable points regarding combined vaccination.

Yours faithfully,
H. C. SWANN.

See Correction p. 214

London Road,
King's Lynn,
Norfolk.
February 27th, 1960.

"Warfarin Poisoning at Derby Stadium"—a Different Interpretation

Sir,—Since I am mentioned, albeit anonymously, in the text of this paper (*Vet. Rec.* **72**, 102), I may perhaps be allowed to make some remarks on it.

I have no connexion with the N.G.R.S., but went to Derby at the request of the National Greyhound Racing Club, for whom I am an honorary consultant. The N.G.R.C. is the ruling body of all licensed tracks in the country. Among its many activities it keeps a record of all deaths occurring on licensed tracks, and the secretary and stewards were very uneasy about the continuing fatalities at Derby, hence my visit on February 27th, 1959, when 8 greyhounds were already dead, and the episode had lasted for 14½ weeks with dogs still dying.

Although trials were put on for my benefit I did not ask for them, and as stated by the authors, "Pointed Palm" fell dead. One trial had passed off satisfactorily. "Pointed Palm" came out with 2 other dogs to go on the track; he did not look fit, and I said so. He took his chance, dragged his hind legs for a few yards when half-way round, and dropped unconscious, to die in a matter of minutes. *Post mortem* was as stated in the article. This was to be the last death reported.

Two factors are incriminated by the authors as the causes of death—(1) warfarin poisoning and (2) canine virus hepatitis. What were the records of these conditions?

Warfarin had been used on the premises, and in over a year two 2-lb. canisters of ready-mixed bait had been purchased. I understand that the concentration of warfarin was 0.005 per cent. This means that 100 mg. of pure warfarin was available altogether. Since the food for 80 dogs for each day was always mixed in one operation, this allows only 1.25 mg. per dog. If the weight of a greyhound is taken at 25 kg. (55 lb.) this gives us a maximum available single dose of 0.05 mg. per kg. for each dog—assuming an even mix. Since only a part of the bait is suspected of getting, mysteriously, into the biscuit, and the deaths were occurring over several weeks, the actual daily dose reaching the dogs, assuming an even mix, could have been, at the most, only a minute fraction of 0.05 mg. per kg. The lowest single dose of warfarin fatal to a dog as quoted in the literature is 20 mg. per kg. (Papworth, 1958), but 5 to 10 mg. per kg. is likely to kill if administered over 3 to 4 days (Bentley, private communication). The Derby figures are very much below this.

Canine virus hepatitis has not been proved to be a kennel sickness of greyhounds. There is no doubt that blood taken from any group of, say, 40 greyhounds in a kennel will be positive to tests for antibodies of canine virus hepatitis in 90 per cent. of cases. My extensive experience of this fact, and the very low death-rates in the handling of thousands of distemper-immune greyhounds over the last 5 years, enable me to put this into its proper perspective. In my view this state of being positive to canine virus hepatitis in blood tests has had no effect on the lives of adult greyhounds under my care.

My Derby findings and conclusions were not in agreement with those of the authors. I had not seen the first 8 deaths, nor been to any of the *post-mortem* examinations. In effect these carcases demonstrated a serious lack of prothrombin, and would, of course, have suggested death from warfarin. But in the absence of proof of presence in either carcase or

food, it seemed to me to be important to enquire into diet. Despite the statement of the findings of the authors, I am of opinion that the deaths were basically due to dietetic (vitamin) deficiencies. Whatever part the absurdly small amounts of warfarin may have played in the death roll (I doubt if it was any), it is my opinion that if the feeding had been right there would have been a very different story to tell. After long experience I have every confidence in stating that, in my opinion, the fault lay in the way the food was presented to the dogs. One of the local veterinary surgeons told me he would have liked to change the diet, as he did not think it was right, but could not get the authority. I thought that unfortunate.

The regular daily diet consisted of approximately 1 lb. of broken biscuit meal mainly of a white flour, 1 lb. approximately of meat or meat offal, and a liberal supply of vegetables. The meat and vegetables for the following day were put into a "copper" on the previous night, and cooked by the night-watchman. This "soup" was boiled for anything up to 8 hours, and next day the lot was emptied into a big bath holding the 80 lb. of biscuit meal. Part of this was used for the morning meal and the remainder for the afternoon meal, the well-boiled meat being cut up or minced, and divided amongst the dogs. Sometimes 3 pints of milk (for 80 dogs) was given, but this was kept as a rule, I was told, for the Open Race dogs, and was not regular.

I could see that, at the start, all the necessary ingredients could just about be there. I thought the dogs looked well, on the whole, but there is a vast difference in dietetic demand between a dog that looks reasonably well on what was a maintenance diet, and a dog which is stretched to the limit in his keenness to catch a hare driven relentlessly before him on an electric trolley.

In my view the broken biscuit, soaked with a completely vitamin-killed broth, did not give the dogs the necessary food requirements, and they could not be expected to continue to stand up to work. The biscuit itself, handled properly, and having essentials added, could have done its part well enough; but since there was nothing but soup containing over-cooked proteins, and the minerals and roughage from the vegetables added to the biscuit, I found myself wondering if the dogs would have been any worse off had they got only hot water and salt added to the biscuit. I bethought myself of the sailors of years ago, with only ship's biscuit and water, and what their fate was after long voyages.

There are records of 2 comparable outbreaks of sickness diagnosed as scurvy, which broke out amongst soldiers in the 1914-18 war. One was in a camp in Scotland where 82 men were affected. The cause was investigated and it was discovered that the meat was always served as a stew, the vegetables being added and the whole cooked for about 5 hours. This was considered to be a sufficient explanation of the outbreak.

The other was in France in a Labour Battalion between May and July, 1918, when 142 cases of scurvy were diagnosed. The daily ration contained 8 oz. of fresh vegetables, but these were cooked with the meat and boiled for at least 3 hours. Such feeding was incriminated as an important contributary cause (M.R.C., 1932).

My advice to the local general manager was to change the food at once, to feed rich dried milk reconstituted, to add it to a wholemeal brown bread, and give one meal daily of that diet. I prepared a diet which stressed the importance of raw, or 10 to 15 minutes only boiling of vegetables; I advised the daily use of a small amount of fresh yeast for each dog, and that they should be given an afternoon feed of approximately two-thirds of a pound of wholemeal bread soaked with the salted (slightly) vegetable broth, and to limit the cooking time of the meat. Fast work was temporarly stopped.

I was delighted to know that the manager actually found it was less expensive to feed the dogs properly, and he has used this method for a year now. No more deaths occurred from that day, although a number of dogs which took cramp previously still continued to cramp or run badly and had to be destroyed. This is not surprising. I regarded the cramp cases as dogs which had been having small haemorrhages in their musculature, these often passing unnoticed, apart from their poor "form." Healing and deposition of fibrous tissue in the muscles would render them permanently without elasticity, which no diet would alter later. They were minor casualties in the major catastrophe. Anyone who has seen a greyhound "hamstrung" like this, and mad in his eagerness to chase, and if possible catch, an electric hare, would not be surprised that he cramped.

I reported to the N.G.R.C. that, in my opinion, the Derby greyhounds were suffering from avitaminosis.

I acknowledge gratefully the courtesy of Mr. E. Wilkinson, the local veterinary surgeon, the Directors of Derby Stadium, and Mr. Coleman, the general manager, for the facilities they gave me to see all I wanted to see. I am indebted to the head trainer, who so willingly gave me the details of the feeding arrangements. I am obliged to Dr. E. W. Bentley, of the Ministry of Agriculture, Fisheries and Food, for supplying me with details about dosage of warfarin. Lastly, I am very grateful to the Secretary of the N.G.R.C., Lt.-Col. W. T. Forsdike, for giving me the opportunity to see a unique outbreak which I felt I may never see again.

Yours faithfully,
J. K. BATEMAN.

10, Brackendale,
Winchmore Hill,
London, N.21.
February 20th, 1960.

References

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PAPWORTH, D. S. (1958). *Roy. Soc. Hlth. J.* **78.** 52.

Whither Veterinary Education?

Sir,—To cloud-cuckoo-land, if it be based on the suggestions of recent correspondents (*Vet. Rec.* **72.** 123; **72.** 169).

The nutritionist must be trained in veterinary matters and the veterinarian must be trained in

matters of nutrition, for the simple reason that diet affects both the host and its microbes, and eventually, the microbic environment of the animal.

An unsuitable diet will engender disease in the single animal; equally, disease may be aggravated to epidemic proportions in the herd by an unsuitable diet.

I ought to know, for I happen to be a nutritionist-veterinarian responsible for £250,000 of capital investment; a wages bill of £95,000 per annum; the formulation and manufacture of 5,000 tons of food per annum used in feeding the stock of an organisation which will produce nearly 500,000 poults this season, which has produced over 2½ millions of trouble-free poults during these past seven years, and which will send about 100,000 finished turkeys to market by Christmas. I walk 12 miles when I have to inspect all our breeding stock, for this is how far our folds stretch when placed end to end. I have a well-equipped pathological laboratory, which, at the moment, is idle. Indeed, since my last assistant left us to get married I have not needed to replace her and now have no laboratory staff.

The final result of nutrition controlling disease? We use no drugs; we can make foods about £7 per ton cheaper than our competitors. Despite a rise in wages costs alone of £10,000 compared with last year, we have, this year, lowered the price of poults to our customers. Our infantile mortality (birth to 8 weeks) is less than human infantile mortality (1 year). Our over-all mortality is about 4 per cent. and this includes the rearing of second-quality stock we do not sell to customers (late hatched, help-outs, vermin casualties, accidents, etc.). We get no epidemics of salmonellosis, coccidiosis, blackhead, erysipelas, nor any other of the common diseases of poultry, although 8 or 9 years ago we had all of these in abundance and the funeral pyres never stopped burning.

As I write I am surrounded by a sheaf of Form "B's" (restriction of movement of poultry Orders) served on 2 of our farms because most of the poultry near us have been wiped out with fowl pest (100,000 birds slaughtered right up to our doorstep). A Ministry test for fowl pest of 149 random samples of blood from the breeding flock of one of our farms folded in the next fields to our neighbour who had his whole stock slaughtered—I could throw a stone from our land into his burial pits—proved negative. While I fear the restrictions of fowl pest because they interfere with the running of our business, I have no fear of fowl pest for I regard it as just another disease engendered and aggravated by unsuitable diets. I do not bother much about disinfectants and disinfecting for that which is inside the animal is a great deal more dangerous than that which is outside.

After nearly 20 years in the compounding business, resigning from it because I was sick at heart in dealing with disease engendered by faulty diets, I would prophesy there will be no easement of disease in this country until the veterinarian is properly trained in the disease-engendering-aggravating-complex of faulty diets, and until he acquires sufficient knowledge to evaluate diets properly.

This having been done, the sooner the better, the profession will then have to call for a declaration of ingredients of all diets fed to farm stock and initiate a rigid control over compounders. As things are, anyone with a set of tables of so-called nutritional requirements can set up in the compounding business and push drugs down the gullets of farm animals in an effort to stem the disease which the food formulation engenders.

Recently, I have daily passed a farm, the smoke from which envelops a village. They are burning litter, etc.; cleaning up after an outbreak of fowl pest following the slaughter of the stock. This has kept a team of slaughterers-cum-disinfecters-cum-veterinary officers busy for a fortnight, besides a bulldozer-trenchdigger team as burial party. Some months ago I visited this farm, and at that time the adult stock now slaughtered were youngsters. I read the labels on the bags of food being fed: "Antibiotic at high level. Salmonellae remedy at curative level. Coccidiostat incorporated. Anti-blackhead drug incorporated." The liquid offered to the stock for drinking was a solution of antibiotic. A steam sterilising unit was working full blast on equipment and utensils.

May I quote: "the Minister tabled a *supplementary* estimate for £5 million to meet the compensation and other charges payable for fowl pest since October."

Cloud-cuckoo-land!

Yours faithfully,
T. BARTON MANN,
Director of Veterinary Research.

W. A. Motley Ltd.,
Braust,
Weyhill,
Andover,
Hants.
February 28th, 1960.

"Fluothane" in Canine Surgery

Sir,—In his very interesting paper (*Vet. Rec.* 72. 96), Mr. Ormrod uses very large quantities of halothane ("Fluothane") to anaesthetise comparatively small dogs.

This appears to be due to his very high gas-flow rates (up to 8 litres). The oxygen-flow rate required in open circuit is related to the tidal volume of the patient. In man this is about 500 c.c., and gas-flow rates of 8 to 10 litres are commonly used. The tidal volume of the dog, however, is considerably lower; in the beagle, for example, it is only 200 c.c.

In small animals, therefore, considerably lower gas-flow rates may be used. It is our experience that 4 litres of oxygen per minute are adequate for very large dogs, and 3 litres per minute is the rate most frequently used in practice.

It follows that if, say, 7 litres are used instead of 3, 4 litres of halothane vapour are wasted per minute by blowing off into the atmosphere. Mr. Ormrod uses about 3 per cent. halothane vapour for induction, and about 2 per cent. for maintenance. One c.c. of halothane liquid produces 220 c.c. of vapour under normal conditions, so that the excess of 4 litres of

vapour per minute represents a wastage of some 5 c.c. of halothane for induction, and a further 10 c.c. for every half hour of maintenance.

These figures apply only to open-circuit anaesthesia. In semi-closed and closed-circuit techniques the gas-flow rates are, of course, very considerably reduced.

Yours faithfully,
W. T. HARROW.

Imperial Chemical Industries Limited,
Pharmaceuticals Division,
Fulshaw Hall,
Wilmslow,
Cheshire.
February 26th, 1960.

Close Caging of Dogs

Sir,—Friends in the United States have asked us to obtain, as a matter of urgency and for submission to a Congressional Committee, authentic information as to the technical effects on laboratory dogs of close and prolonged caging. The Food and Drug Administration is carrying out long-term toxicity tests of aniline and other colourings used in human food, and for this purpose beagles are housed, from the age of 3 months, in cages measuring approximately 30 in. × 36 in., in which they remain for 2½ to 3 years, the cages being washed down without removal of the dogs. It is claimed that the provision of exercise runs, even if these were uniform in construction and use, would impair the validity of the tests, the results of which will be applied to human beings living under more normal conditions.

We should be most grateful if any of your readers could supply us with any information bearing on the methodological aspect of prolonged and close caging.

Yours faithfully,
C. W. HUME.
Secretary-General of UFAW.

7a Lamb's Conduit Passage,
London,
W.C.1.
February 23rd, 1960.

The Slaughter Policy for Fowl Pest

Sir,—As fowl pest continues to be a scourge upon the poultry industry and upon the economy of the country, I feel that the time is approaching, or indeed has arrived, when the apparently immutable policy of the Ministry must be questioned. Fowl pest, or at least that part of it which is Newcastle disease, has been rife in this country for the past decade, in spite of the vast amounts of money which have been spent administering the slaughter policy. Many people must be of the opinion that Newcastle disease is now endemic, and whilst the present policy is applicable and practicable so far as fowl plague is concerned, a revision of the legislation to deal with Newcastle disease is required.

The only justifications for the slaughter policy technique in controlling diseases of animals not transmissible to man, are economic ones. When public money is utilised to implement such a policy then the community is being reasonable in expecting results either in the short or long term.

The lists of fowl pest notifications appearing each week in THE VETERINARY RECORD since the 1940s suggest no such assurance, and the expenses incurred make the cost of foot-and-mouth control look like the petty cash account.

There appears to be only one type of Newcastle disease virus, which suggests that a vaccination scheme such as is carried out with some success in other countries is within the bounds of possibility.

The danger, as I see it, is that unless we meet with a large measure of success using present methods in the near future, lay persons are going to question the validity of these methods.

If, in response to this, an august body found that the methods in use were impracticable, then it might, by implication, reflect unfavourably on slaughter policies used with such good effect in another exotic disease, *viz.* foot-and-mouth.

It may be that the observations made are without just foundation, but it is certain that if a change in policy is forced upon us then the stimulus should come from within the profession before that from without.

Yours faithfully,
W. B. CARTMELL.

The Lower House,
Wickham,
Fareham,
Hants.
February 16th, 1960.

A Purchase Tax Warning

Sir,—Mr. Morgan's letter, in your issue of February 20th, must remind us all of the chaotic state of our taxation laws.

Although one specific drug was mentioned in his letter, it would seem utterly indefensible to allow any product used in the prevention or treatment of disease, whether human or veterinary, to attract additional purchase tax.

At the present session of Parliament, Mr. Gerald Nabarro, M.P., is presenting his third "century" of questions on purchase tax anomalies, amongst them being some related to medical products. If the members of our profession would state their views on such tax impositions, either to their own Member of Parliament or to Mr. Nabarro, it would be rendering a service which would be appreciated by all who seek medical or veterinary advice.

Yours faithfully,
G. A. SWIFT.

Over Cuckmere,
Mutton Hall Hill,
Heathfield,
Sussex.
February 27th, 1960.

Sir,—The letter from Mr. J. B. Edwards gave the first indications which we, as manufacturers of Dictol, have had as to the reasons why our application for purchase tax exemption had been refused. We have received no official notification such as has been supplied to your correspondent and, therefore, no opportunity to refute the unjustified allegation of "insufficient knowledge of its efficacy."

It is appreciated that before all the merits and demerits of any vaccine can finally be assessed, field use on a wide scale over a period of years is essential, but this is not to say that the effectiveness of a vaccine as a potential controller of disease cannot be evaluated within a shorter period.

Following successful laboratory scale experiments, field trials were carried out using a single-dose irradiated vaccine in 1957. The protection afforded was good, but nevertheless in 1958 a double-dose technique was used in approximately 8,000 animals on over 200 farms with excellent results. These results were reproduced last year when tens of thousands of animals were immunised with Dictol. It is intended that a report on the field use of Dictol during 1959 will be presented for publication shortly. The 1959 results, despite the fact that in many areas 1959 was not a bad husk year, do, in the opinion of many veterinary surgeons, fully justify much wider use of the vaccine.

Proof of efficacy before purchase tax exemption is granted is, however, not the only issue. According to the wording of existing regulations, if Dictol could be prepared for administration by injection it would automatically have been exempted from tax and we should not have been required to provide any information whatsoever on the effectiveness of the vaccine.

Yours faithfully,
F. H. JOHNSON.

Veterinary Division,
Allen & Hanburys Ltd.,
Bethnal Green,
London, E.2.
March 2nd, 1960.

SCIENTIFIC

An Observation on the Efficiency of Some Anthelmintics Against *Fasciola gigantica*

Sir,—Two hundred and forty-three cull cows to be slaughtered from a ranch where a fairly heavy incidence of fascioliasis occurred, provided an opportunity to study the effects of some anthelmintics against *Fasciola gigantica*.

The anthelmintics used were:—

(1) Liquid hexachloroethane (a suspension containing 12 g. finely ground hexachloroethane per oz.).

(2) Liquid hexachloroethane and phenothiazine a proprietary preparation containing hexachloroethane, 8 g. per fluid. oz.; phenothiazine, 7 g. per fluid oz.

(3) Carbon tetrachloride in oil (5 c.c. CCl_4 in 20 c.c. Arachis oil).

The cows were divided at random into 7 groups of approximately 35 in each group.

Group A. Received 2 doses (5 oz. per dose) of hexachloroethane, 21 days apart. Before dosing each time, prestimulation of the oesophageal groove was carried out with 2 oz. of 10 per cent. NaCl.

Group B. Received 2 doses (5 oz. each) of hexachloroethane 21 days apart with no prestimulation of the oesophageal groove.

Group C. Received a single dose (6 oz.) of the hexachloroethane-phenothiazine mixture after prestimulation with 2 oz. of 10 per cent. NaCl.

Group D. Received a single dose (5 oz.) of hexachloroethane with no prestimulation.

Group E. Received a single dose (6 oz.) of hexachloroethane-phenothiazine mixture with no prestimulation.

Group F. Received a single dose of 20 c.c. of the carbon tetrachloride in oil.

Group G. Controls.

Twenty-one days after treatment, or cases where 2 doses were given 21 days after the last dose, the cows were slaughtered. The livers were examined for (1) evidence of thickening and calcification of the bile ducts which was presumed to be due to Fasciola infestation, and (2) the presence of live liver flukes.

Results

POST-MORTEM EXAMINATION OF LIVERS

Groups	No sign of fascioliasis	Evidence of fluke infestation	Live flukes present	Per cent. from which flukes eliminated
A—35 head	26	9	3	66
B—34 ,,	29	5	1	80
C—34 ,,	27	7	1	85
D—31 ,,	23	8	4	50
E—35 ,,	32	3	2	33
F—35 ,,	19	16	12	25
G—39 ,,	25	14	14	Nil
Totals: 243	181	62	—	—

From the results it appears that among the 243 cows concerned evidence of fascioliasis was seen in 62 head giving an over-all infestation of 25.5 per cent.

The results are conflicting, and showed only that the mixture of hexachloroethane and phenothiazine, and the carbon tetrachloride in oil were inferior to pure hexachloroethane, and that the latter was not 100 per cent. efficient.

Acknowledgments.—Messrs. Cooper McDougall and Robertson Ltd. are thanked for supplies of hexachloroethane and hexaphine, and Messrs. May and Baker Ltd., are thanked for supplies of carbegan. I am grateful to the staff of Charter Estates, for the use of their cattle and assistance in dosing them.

Yours faithfully,
J. B. CONDY.

Veterinary Research Laboratory,
Salisbury.
February 21st, 1960.